SANTANA ROW EXPANSION PROJECT AIR QUALITY AND GHG EMISSIONS ASSESSMENT

San José, California

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INTRODUCTION

The purpose of this report is to address air quality and greenhouse gas (GHG) emission impacts associated with the proposed Santana Row Expansion Project. The current PD zoning for the 40.62-acre Santana Row site allows a maximum of 937,500 square feet (s.f.) of commercial space, 214 hotel rooms, and 1,182 residential units. The project proposes to increase the size of the site by 1.91 acres and increase the allowable office space entitlement by 270,000 s.f. The project proposes to construct two parking garages on Lots 9 and 17, one with five levels of above-grade parking structure and one level of below-grade parking, and another with at least three level of above-grade parking, for a total of 1,889 parking spaces.

Air quality and GHG impacts would occur due to temporary construction emissions and as a result of direct and indirect emissions from new occupants and customers. This analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).

SETTING

The project is located in the northern portion of the Santa Clara County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}).

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and Federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by CARB, and are listed as carcinogens either under the state's Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of diesel particulate matter (DPM). Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.¹ The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, CARB (a part of the California Environmental Protection Agency) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published the California Environmental Quality Act (CEQA) Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.²

Greenhouse Gases

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO₂) and water vapor but there are also several others, most importantly methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO₂ and N₂O are byproducts of fossil fuel combustion.
- N₂O is associated with agricultural operations such as fertilization of crops.
- CH₄ is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.

¹ Available online: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed: June 16, 2014.

² Bay Area Air Quality Management District. 2011. BAAQMD CEQA Air Quality Guidelines. May.

- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO₂ being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger with a GWP of 23,900. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO₂ equivalents (CO₂e).

An expanding body of scientific research supports the theory that global warming is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California could be adversely affected by the global warming trend. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes and drought; and increased levels of air pollution.

Significance Thresholds

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These Thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines (updated May 2011). The significance thresholds identified by BAAQMD and used in this analysis are summarized in Table 1.

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines was called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, this litigation remains pending as the California Supreme Court recently accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument to be considered is in regard to whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). Therefore, the significance thresholds contained in the 2011 CEQA Air Quality Guidelines are applied to this project.

Table 1 Air Quality Significance Thresholds

	Construction Thresholds	Operational Thresholds			
Pollutant	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)		
Criteria Air Pollutants					
ROG	54	54	10		
NO _x	54	54	10		
PM_{10}	82	82	15		
PM _{2.5}	54	54	10		
СО	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm hour average)			
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable			
Health Risks and Hazards	for New Sources				
Excess Cancer Risk	10	per one million			
Chronic or Acute Hazard Index		1.0			
Incremental annual average PM _{2.5}		$0.3~\mu g/m^3$			
	for Sensitive Receptors (Cumu nulative Thresholds for New So		es within 1,000 foot		
Excess Cancer Risk	100	per one million			
Chronic Hazard Index		10.0			
Annual Average PM _{2.5}		$0.8~\mu g/m^3$			
Greenhouse Gas Emissions					
GHG Annual Emissions	1,100 metric ton	s or 4.6 metric tons pe	r capita		
an aerodynamic diameter of 10	gases, NOx = nitrogen oxides, PM ₁₀ micrometers (μm) or less, PM _{2.5} = fi n or less, and GHG = greenhouse gas	ne particulate matter or p			

IMPACTS AND MITIGATION MEASURES

Impact 1: Conflict with or obstruct implementation of the applicable air quality plan? *No Impact*

The most recent clean air plan is the *Bay Area 2010 Clean Air Plan* that was adopted by BAAQMD in September 2010. This plan addresses air quality impacts with respect to obtaining ambient air quality standards for non-attainment pollutants (i.e., ozone and particulate matter or PM₁₀ and PM_{2.5}), reducing exposure of sensitive receptors to toxic air contaminants (TACs), and reducing greenhouse gas emissions such that the region can meet AB 32 goals of reducing emissions to 1990 levels by 2020.

Emissions of non-attainment air pollutants are addressed under Impact 2 and 3. Exposure of sensitive receptors (existing receptors) is addressed under Impact 4.

Clean Air Plan Projections

The consistency of the proposed project with this regional plan is primarily a question of the consistency with the population/employment assumptions utilized in developing the 2010 Clean Air Plan, which were based on ABAG Projections. The proposed project would not substantially affect current growth projections in the region and is consistent with the Clean Air Plan.

Consistency with Clean Air Plan Control Measures

The 2010 CAP includes about 55 control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The control measures are divided in to five categories that include:

- 18 measures to reduce stationary and area sources;
- 10 mobile source measures;
- 17 transportation control measures;
- 6 Land use and local impact measures; and
- 4 Energy and climate measures

In developing the control strategy, BAAQMD identified the full range of tools and resources available, both regulatory and non-regulatory, to develop each measure. Implementation of each control measure will rely on some combination of the following:

- Adoption and enforcement of rules to reduce emissions from stationary sources, area sources, and indirect sources;
- Revisions to the BAAQMD's permitting requirements for stationary sources;
- Enforcement of CARB rules to reduce emissions from heavy- duty diesel engines;
- Allocation of grants and other funding by the Air District and/or partner agencies;
- Promotion of best policies and practices that can be implemented by local agencies through guidance documents, model ordinances, etc.;
- Partnerships with local governments, other public agencies, the business community, non- profits, etc.;
- Public outreach and education;
- Enhanced air quality monitoring;
- Development of land use guidance and CEQA guidelines, and Air District review and comment on Bay Area projects pursuant to CEQA; and
- Leadership and advocacy.

This approach relies upon lead agencies to assist in implementing some of the control measures. A key tool for local agency implementation is the development of land use policies and implementing measures that address new development or redevelopment in local communities. The consistency of the project is evaluated with respect to each set of control measures.

Stationary and Area Source Control Measures

The CAP includes Stationary Source Control measures that BAAQMD adopts as rules or regulations through their authority to control emissions from stationary and area sources. The BAAQMD is the implementing agency, since these control measures are applicable to sources of air pollution that must obtain District permits. Any new stationary sources would be required to obtain proper permits through BAAQMD. In addition, the City uses BAAQMD's CEQA Air Quality Guidelines to evaluate air pollutant emissions from new sources.

Mobile Source Measures

The CAP includes Mobile Source Measures that would reduce emissions by accelerating the replacement of older, dirtier vehicles and equipment through programs such as the BAAQMD's Vehicle Buy-Back and Smoking Vehicle Programs, and promoting advanced technology vehicles that reduce emissions. The implementation of these measures rely heavily upon incentive programs, such as the Carl Moyer Program and the Transportation Fund for Clean Air, to achieve voluntary emission reductions in advance of, or in addition to, CARB requirements. CARB has new regulations that require the replacement or retrofit of on-road trucks, construction equipment and other specific equipment that is diesel powered.

Transportation Control Measures

The CAP includes transportation control measures (TCMs) that are strategies meant to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions. While most of the TCMs are implemented at the regional level (e.g., by MTC or Caltrans), there are measures that the CAP relies upon local communities to assist with implementation. In addition, the CAP includes land use measures and energy and climate measures where implementation is aided by proper land use planning decisions. The City's latest General Plan update includes measures to reduce vehicle travel that are consistent with the CAP TCMs. While the project proposes to modify the existing Planned Development (PD) zoning for Santana Row to allow for additional development, a General Plan amendment would not be required, and growth projections would not be expected to substantially differ from those in the General Plan.

TAC Exposure

The City uses the BAAQMD CEQA Air Quality Guidelines to identify community risk impacts and develop appropriate mitigation measures, as necessary. The CAP includes measures to reduce TAC exposure to sensitive receptors. Health risk impacts from nearby TAC sources are addressed under Impact 4 below.

Impact 2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? **Less than significant with construction-period mitigation**

The Bay Area is considered a non-attainment area for ground-level ozone and fine particulate matter (PM_{2.5}) under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM₁₀) under the California Clean Air Act, but not the Federal act. The area has attained both State and Federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and PM₁₀, the BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO_X), PM₁₀ and PM_{2.5} and apply to both construction period and operational period impacts.

The California Emissions Estimator Model (CalEEMod) Version 2013.2.2 was used to predict emissions from construction and operation of the site assuming full build out of the project. The project land use types and size, and trip generation rate were input to CalEEMod.

Construction period emissions

CalEEMod provided annual emissions for construction for both Lots 9 and 17. CalEEMod provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. A construction build-out scenario, including equipment list and phasing schedule was provided by the project applicant.

Lot 9 would require approximately 93,000 cubic yards soil export and 29,000 cubic yards soil import. The anticipated 10,250 tons for pavement demolition was entered into the model, along with approximately 1,625 cement truck trips needed during building construction and 3,000 asphalt trucks needed during the sitework/paving phase.

Lot 17 would require approximately 6,000 cubic yards soil export. The anticipated 51,000 s.f. for building demolition and 760 tons for pavement demolition were entered into the model, along with approximately 750 cement truck trips needed during building construction and 31 asphalt trucks needed during the paving phase. *Attachment 1* includes the CalEEMod input and output values for construction emissions.

The proposed project land uses for construction were input into CalEEMod, which included 254,000 s.f. of "Office Park," and 34,000 s.f. of "Strip Mall" (retail) for Lot 9; and 256,000 s.f. of "Office Park" for Lot 17. The project proposes 1,889 parking garage spaces that were modeled as "Enclosed Parking with Elevator."

The modeling scenario assumes that the project would be built out over a period of approximately 38 months beginning in November 2014 through July 2016 for Lot 9 and continuing in March 2017 through September 2018 for Lot 17, or an estimated 836 construction workdays (based on an average of 22 workdays per month). Average daily emissions were computed by dividing the total construction emissions by the number of construction days. Table 2 shows average daily construction emissions of ROG, NOx, PM₁₀ exhaust, and PM_{2.5} exhaust during construction of the project. As indicated in Table 2, predicted project emissions would not exceed the BAAQMD significance thresholds.

Construction activities, particularly during site preparation and grading would temporarily generate fugitive dust in the form of PM₁₀ and PM_{2.5}. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. Fugitive dust emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. Fugitive dust emissions would also depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are employed to reduce these emissions. *Mitigation Measure 1 would implement BAAQMD-required best management practices*.

Table 2 Construction Period Emissions

			PM_{10}	$PM_{2.5}$
Scenario	ROG	NO_X	Exhaust	Exhaust

Exceed Threshold?	No	No	No	No
BAAQMD Thresholds (pounds per day)	<i>54</i> lbs.	<i>54</i> lbs.	82 lbs.	<i>54</i> lbs.
Average daily emissions ¹	21.3 lbs.	38.7 lbs.	1.7 lbs.	1.6 lbs.
2018 Lot 17 Construction emissions	1.55 tons	1.65 tons	0.09 tons	0.08 tons
2017 Lot 17 Construction emissions	0.31 tons	2.38 tons	0.13 tons	0.13 tons
2016 Lot 9 Construction emissions	5.86 tons	2.74 tons	0.12 tons	0.11 tons
2015 Lot 9 Construction emissions	1.08 tons	8.33 tons	0.33 tons	0.31 tons
2014 Lot 9 Construction emissions	0.09 tons	1.09 tons	0.03 tons	0.03 tons

Notes:

Operational Period Emissions

Operational air emissions from the project would be generated primarily from autos driven by future employees and customers. Evaporative emissions from architectural coatings and maintenance products are other typical emissions from commercial uses. CalEEMod was used to predict emissions from operation of the site assuming full build out of the project. Model inputs are summarized below.

Model Year

The model uses mobile emission factors from the California Air Resources Board's EMFAC2011 model. This model is sensitive to the year selected, since vehicle emissions have and continue to be reduced due to fuel efficiency standards and low carbon fuels. The Year 2019 was analyzed since it is the first full year that the project could conceivably be occupied. Use of this date is considered conservative, as emissions associated with build-out later than 2019 would be lower. An Existing Zoned/Baseline scenario was also run for 2019. In order to run both scenarios, an Existing 2019 run was conducted, along with a Net Existing Zoned/Baseline 2019 run and a Net Proposed Project 2019 run. Net Existing Zoned/Baseline emissions were added to the Existing Zoned/Baseline scenario. Similarly, Net Proposed Project emissions were added to the Existing 2019 run to estimate the Proposed Project scenario.

Land Use Descriptions

The Existing 2019 land use types and size were input to a CalEEMod run, with the following land uses: 60,000 s.f. of "Office Park," 214 hotel rooms entered as "Hotel," 726 dwelling units entered as "Apartments Mid-Rise," 472,161 s.f. of retail entered as "Strip Mall," and 98,742 s.f. of restaurants entered as "High Turnover (Sit Down Restaurant)."

The Net Existing Zoned/Baseline run consisted of 225,000 s.f. of "Office Park," 456 dwelling units entered as "Apartments Mid-Rise," 35,139 s.f. of retail entered as "Strip Mall," and 46,458 s.f. of restaurants entered as "High Turnover (Sit Down Restaurant)."

The Net Proposed Project run consisted of 495,000 s.f. of "Office Park," 456 dwelling units entered as "Apartments Mid-Rise," 35,139 s.f. of retail entered as "Strip Mall," 46,458 s.f. of restaurants entered as "High Turnover (Sit Down Restaurant)," and the 1,889 parking space structure.

¹ Assumes 836 workdays.

Trip Generation Rates

Default trip generation rates, trip lengths, and trip types specified by CalEEMod for Santa Clara County were used. Because the project site is located in a mixed-use area with proximity to regional transit, physical characteristics of the project were entered into the model. By the nature of the model, these physical effects are included in the mitigated portion of the model output.

- The project site jobs/acre and dwelling units/acre;
- The number of intersections per square mile;
- The distance to job center (the project itself will be a significant job center with many office and retail uses);
- The distance to the nearest transit station (Valley Fair Transit Center); and
- The project site will include an inter-connected pedestrian network.

Energy

The 2013 Title 24 Building Standards became effective July 1, 2014 and are predicted to result in 25 percent less energy use for lighting, heating, cooling, ventilation, and water heating than the 2008 standards that CalEEMod is based on.³ Therefore, the Net Zoned/Baseline and Net Proposed Project CalEEMod runs were adjusted to account for the greater energy efficiency of future zoned or proposed buildings.

Table 3 reports the predicted average daily operational emissions and Table 4 reports annual emissions. As shown in Tables 3 and 4, average daily and annual net emissions of ROG, NO_X , PM_{10} , or $PM_{2.5}$ emissions associated with operation would not exceed the BAAQMD significance thresholds.

Table 3 Daily Air Pollutant Emissions from Operation of the Project (pounds/day)

Scenario	ROG	NO_X	PM_{10}	$PM_{2.5}$
2019 Project	213.6	197.4	125.1	36.2
Existing Zoned/Baseline	182.8	185.2	116.2	33.6
Net Project	30.8	12.2	8.9	2.6
Daily Emission Thresholds	54	54	82	54
Exceed Threshold?	No	No	No	No

 Table 4 Annual Air Pollutant Emissions from Operation of the Project (tons/year)

Scenario	ROG	NOx	PM_{10}	PM _{2.5}
2019 Project	38.99	36.03	22.83	6.60
Existing Zoned/Baseline	33.36	33.79	21.21	6.13
Net Project	5.63	2.24	1.62	0.47
Annual Emission Thresholds	10	10	15	10

³ California Energy Commission, 2012. 2013 Building Energy Efficiency Standards FAQ. May.

Exceed Threshold?	No	No	No	No	
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Note: Total project values reported are from CalEEMod output, though may not total exactly in the table due to rounding.

Mitigation Measure 1: Include measures to control dust emissions.

Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality and fugitive dust-related impacts associated with grading and new construction to a less than significant. The contractor shall implement the following Best Management Practices that are required of all projects:

- 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- 4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
- 5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible and feasible. Building pads shall be laid as soon as possible and feasible, as well, after grading unless seeding or soil binders are used.
- 6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- 7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- 8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Impact 3: Violate any air quality standard or contribute substantially to an existing or projected air quality violation? *Less than significant*

As discussed under Impact 2, the project would have emissions less than the significance thresholds adopted by BAAQMD for evaluating impacts related to ozone and particulate matter. Therefore, the project would not contribute substantially to existing or projected violations of

those standards. Carbon monoxide emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that carbon monoxide levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. There is an ambient air quality monitoring station in San Jose that measures carbon monoxide concentrations. The highest measured level over any 8-hour averaging period during the last 3 years is less than 3.0 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm. Intersections affected by the project would have hourly traffic volumes less than 10,000 and much less than the BAAQMD screening criteria and, therefore, would not cause a violation of an ambient air quality standard or have a considerable contribution to cumulative violations of these standards.⁴

Impact 4: Expose sensitive receptors to substantial pollutant concentrations? Less than significant with construction and operational period mitigation measures

Sensitive receptors are locations where an identifiable subset of the general population (children, asthmatics, the elderly, and the chronically ill) that is at greater risk than the general population to the effects of air pollutants are likely to be exposed. These locations include residences, schools, playgrounds, childcare centers, retirement homes, hospitals, and medical clinics. Operation of the project is not expected to cause any localized emissions that could expose sensitive receptors to unhealthy air pollutant levels. Construction activity would generate dust and equipment exhaust on a temporary basis. There are nearby sources of air pollutant emissions, such as roadways and stationary sources of TACs. Impacts from project construction and existing sources of air pollution are addressed.

Project Construction Activity

Construction activity is anticipated to involve demolition of existing on-site buildings and parking lot areas, and building construction. As discussed under Impact 2, the project would have less-than-significant construction period emissions. While those thresholds primarily address the potential for emission to adversely affect regional air quality, localized emissions of dust or equipment exhaust could affect nearby sensitive land uses. During demolition and construction activities, dust would be generated. Most of the dust would result during grading activities. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed at any given time, amount of activity, soil conditions and meteorological conditions. Typical winds during late spring through summer are from the north. Nearby land uses could be adversely affected by dust generated during construction activities. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are employed to reduce these emissions. *Mitigation Measure 1 would implement BAAQMD-required best management practices*.

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⁴ For a land-use project type, the BAAQMD CEQA Air Quality Guidelines state that a proposed project would result in a less than significant impact to localized carbon monoxide concentrations if the project would not increase traffic at affected intersections to more than 44,000 vehicles per hour.

Construction equipment and associated heavy-duty truck traffic generate diesel exhaust, which is a known Toxic Air Contaminant (TAC). As indicated under Impact 3, these emissions would not be considered to contribute substantially to existing or projected air quality violations. The BAAQMD has not developed any procedures or guidelines for identifying these impacts from temporary construction activities where diesel particulate matter emissions are transient. TAC emissions are typically evaluated for stationary sources (e.g., large compression ignition engines such as generators) in health risk assessments over the course of lifetime exposures (i.e., 24 hours per day over 70 years).

Diesel exhaust and PM_{2.5} pose both potential health and nuisance impacts to nearby receptors. A health risk assessment of the project construction activities was conducted that evaluated potential health effects of sensitive receptors at nearby residences from construction emissions of diesel particulate matter (DPM) and PM_{2.5}.⁵ A dispersion model was used to predict the off-site DPM concentrations resulting from project construction so that lifetime cancer risks could be predicted. The closest residences to the project site are less than 100 feet from Lot 9 on Hatton Street east of the site, and on Olsen Drive north of the site. Figure 1 shows the project site and sensitive receptor locations (residences) used in the air quality dispersion modeling analysis where potential health impacts were evaluated.

Construction Emissions

The refined health risk assessment focused on modeling on-site construction activity using construction fleet information included in the project design features. Construction period emissions were modeled using CalEEMod along with projected construction activity. The number and types of construction equipment and diesel vehicles, along with the anticipated length of their use for different phases of construction were based on site-specific construction activity schedules provided. Construction of the project is expected to occur over a 38 month period during 2014 through 2018, beginning in November 2014.

The CalEEMod model provided total annual PM_{2.5} exhaust emissions (assumed to be diesel particulate matter) for the off-road construction equipment and for exhaust emissions from onroad vehicles (haul trucks, vendor trucks, and worker vehicles), with total emissions of 0.5689 tons (1,138 pounds). The on-road emissions are a result of haul truck travel, worker travel, and vendor deliveries during building demolition, grading and construction activities. A trip length of 0.3 miles was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive PM_{2.5} dust emissions were calculated by CalEEMod as 0.215 tons (430 pounds) for the overall construction period. The project emission calculations and construction schedule are provided in *Attachment 1*.

<u>Dispersion Modeling</u>

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at existing sensitive receptors (residences) in the vicinity of the project construction area. Emission sources for the construction site were grouped into two categories:

⁵ DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

exhaust emissions of DPM and fugitive PM_{2.5} dust emissions. Combustion equipment exhaust emissions were modeled as point sources with a nine foot release height (construction equipment exhaust stack height) placed at 10 meter (32.8 feet) intervals throughout the construction site. This resulted in 119 individual point sources being used to represent mobile equipment DPM exhaust emissions in Lot 9 and 70 individual point sources in Lot 17, with DPM emissions occurring throughout the project site. Emissions from vehicle travel on- and off-site were distributed among the point sources throughout the site. Construction fugitive PM_{2.5} dust emissions were modeled as area sources, one for Lot 9 and one for Lot 17, encompassing each construction site with a near ground level release height of two meters. Construction emissions were modeled as occurring daily between 7 a.m. and 4 p.m.

The modeling used a five-year data set (2006 - 2010) of hourly meteorological data from the San Jose Airport prepared by the BAAQMD for use with the AERMOD model. Annual DPM and PM_{2.5} concentrations from construction activities in 2014 through 2018 were calculated using the model. DPM and PM_{2.5} concentrations were calculated at nearby residential locations at a receptor height of 1.5 meters (4.9 feet) and 4.5 meters (14.8 feet) to represent the first and second building levels of nearby multi-story townhomes and other residences. Additionally, for the second floor residences north of site on Olsen Drive that are located above the street level businesses receptor heights of 7.6 meters (25 feet) were used. Figure 1 shows the construction areas and DPM point sources modeled for Lots 9 and 17, and the locations of nearby residential receptors.

The maximum-modeled $PM_{2.5}$ and DPM concentration occurred directly across from the Lot 9 construction site at a residence on Hatton Street. The location where the maximum $PM_{2.5}$ and DPM concentrations occurred is identified on Figure 1 as the location of maximum cancer risk.

Predicted Cancer Risk and Hazards

Increased cancer risks were calculated using the modeled concentrations and BAAQMD recommended risk assessment methods for infant exposure (3rd trimester through 2 years of age), child exposure, and for an adult exposure.⁶ The cancer risk calculations were based on applying the BAAQMD recommended age sensitivity factors to the DPM exposures. Agesensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. Since the modeling was conducted under the assumption that emissions occurred daily for a full year during each construction year, the default BAAQMD exposure period of 350 days per year was used.⁷ Infant, child, and adult exposures were assumed to occur at all residences through the entire construction period.

Results of this assessment indicate that for project construction the maximum increased child cancer risk would be 28.7 in one million and the maximum increased adult cancer risk would be 1.9 in one million. The increased cancer risk for a child exposure would be higher than the

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⁶ Bay Area Air Quality Management District (BAAQMD), 2012, Recommended Methods for Screening and Modeling Local Risks and Hazards, May.

⁷ Bay Area Air Quality Management District (BAAQMD), 2010, *Air Toxics NSR Program Health Risk Screening Analysis Guidelines*, January.

BAAQMD significance threshold of a cancer risk of 10 in one million or greater and would be considered a *significant impact*.

The maximum annual PM_{2.5} concentration was 0.42 micrograms per cubic meter ($\mu g/m^3$) occurring at the same location where maximum cancer risk would occur. This PM_{2.5} concentration is greater than the BAAQMD significance threshold of 0.3 $\mu g/m^3$ used to judge the significance of health impacts from PM_{2.5}. This would be considered a *significant impact*.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. Non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). California's Office of Environmental Health and Hazards (OEHHA) has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The chronic inhalation REL for DPM is 5 μ g/m³. The maximum modeled annual residential DPM concentration was 0.245 μ g/m³, which is much lower than the REL. The maximum computed hazard index based on this DPM concentration is 0.049 which is much lower than the BAAQMD significance criterion of a hazard index greater than 1.0

Attachment 2 includes the emission calculations used for the area source modeling and the cancer risk calculations.

The project would have a *significant impact* with respect to community risk caused by construction activities.

Mitigation Measure AQ-2: Selection of equipment during construction to minimize emissions. Such equipment selection would include the following:

- 1. All diesel-powered off-road equipment larger than 50 horsepower and operating at the site for more than two days continuously shall meet U.S. EPA particulate matter emissions standards for Tier 2 engines or equivalent;
- 2. All portable diesel-powered equipment (i.e., forklifts, aerial lifts, air compressors, and generators) shall meet U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent; or the construction contractor shall use other measures to minimize construction period diesel particulate matter emissions to reduce the predicted cancer risk below the threshold. Such measures may include the use of alternative-powered equipment (e.g., LPG-powered forklifts, electric compressors), alternative fuels (e.g., biofuels), added exhaust devices, or a combination of measures, provided that these measures are approved by the lead agency; and
- 3. Minimize the number of hours that equipment will operate, including the use of idling restrictions.

Effectiveness of Mitigation Measure AQ-1 and AQ-2

Implementation of Mitigation Measure AQ-2 would reduce on-site diesel exhaust emissions by approximately 72 percent. Implementation of Mitigation Measure AQ-1, which are the Best

Management Practices recommended by BAAQMD, is considered to reduce exhaust emissions by an additional 5 percent. Emissions associated with implementation of Mitigation Measure AQ-2 were modeled using CalEEMod, however CalEEMod is not set up to account for any additional reductions due to implementation of Mitigation Measure AQ-1, and thus were not taken. Modeled mitigated emissions were then input back into the dispersion model to predict concentration of DPM and annual PM_{2.5}. The computed maximum excess child cancer risk with implementation of mitigation measures would be 8.1 per million and the PM_{2.5} concentration would be 0.27 μ g/m³. Excess child cancer risk would be reduced to below 10 chances per million and annual PM_{2.5} concentrations would be reduced below 0.3 μ g/m³. As a result, the project with mitigation measures would have *a less-than-significant* impact with respect to community risk caused by construction activities.

4130900 4130800-Olsen Dr Lot 9 UTM - North (meters) 4130700 4130600 1-280 4130500-4130400 593300 592700 592800 592900 593000 593100 593200 593400 593500 593600 593700 UTM - East (meters) Construction Area Sources Used for PM2.5 Modeling Construction Point Sources Used for DPM Modeling Sensitive Receptor (residences) Locations Location of Maximum Cancer Risk and PM2.5 Impact

Figure 1. Project Site, Construction Modeling Sources, Residential Receptor Locations, and Location of Maximum Cancer Risk

Operational TAC Impacts

Operation of the project is not considered a source of TAC or PM_{2.5} emissions and no stationary sources are proposed, such as emergency back-up diesel generators. As a result, the project operation would not cause emissions that expose sensitive receptors to unhealthy air pollutant levels. Because the project would not be a source of TACs, it would not contribute cumulatively to unhealthy exposure to TACs.

The project would include new sensitive receptors in the form of residences. Substantial sources of air pollution can adversely affect sensitive receptors proposed as part of new projects. A review of the area indicates that there is one highway within 1,000 feet of the site that could adversely affect new residences and four stationary sources of air pollution are located near the site. There are thresholds that address both the impact of single and cumulative TAC sources upon projects that include new sensitive receptors. The future location of these units has not yet been determined. As such, this analysis used screening data provided by BAAQMD to identify the potential cancer risk and PM_{2.5} exposure risks at various distances.

<u>Highway Impacts – Interstate 280</u>

Traffic on high volume roadways is a source of TAC emissions that may adversely affect sensitive receptors in close proximity the roadway. For roadways, BAAQMD has published screening data to determine if highways with traffic volumes of over 10,000 vehicles per day may have a significant effect on a proposed project.

BAAQMD provides a *Highway Screening Analysis Tool* (a Google Earth mapping tool) to identify estimated risk and hazard impacts from highways throughout the Bay Area. This tool provides the screening level estimate of lifetime excess cancer risk and hazard impacts that representative of the average annual daily traffic (AADT) count, fleet mix, and other modeling parameters specific to a selected segment of the highway. The closest portion of the project site to Interstate 280 (I-280) is within 100 feet of the nearest travel lane. The BAAQMD Highway Screening Analysis Tool provided cancer risk, hazard, and PM_{2.5} impact levels for this segment of roadway at various screening distances from 50 to 1,000 feet at a receptor height of 6 feet. As shown in Table 5, the cancer risk associated with I-280 traffic would be potentially significant within approximately 800 feet, whereas annual PM_{2.5} concentration would be potentially significant impact. Implementation of Mitigation Measure AQ-3 would be required. Hazard index (HI) would be below the BAAQMD significance threshold.

Table 5 I-280, Link 305 (6 ft. elev.) Cancer Risk, PM_{2.5} Concentration, and Hazard Index

	Cancer	PM _{2.5}	Acute and
	Risk (per	Concentration	Chronic
Roadway	million)	$(\mu g/m^3)$	Hazard (HI)
I-280 - 75 ft. North	52.5	0.45	0.05
I-280 - 100 ft. North	45.9	0.39	0.05
I-280 - 200 ft. North	30.9	0.26	0.03
I-280 - 300 ft. North	23.5	0.19	0.02

I-280 - 400 ft. North	18.6	0.15	0.02
I-280 - 500 ft. North	15.3	0.13	0.02
I-280 - 750 ft. North	10.2	0.08	0.01
I-280 - 1,000 ft. North	7.3	0.06	0.01
BAAQMD Thresholds	10.0	0.3	1.0

Impacts from Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Stationary Source Risk & Hazard Analysis Tool*. This mapping tool uses Google Earth to identify the location of stationary sources and their estimated risk and hazard impacts. This tool identified four sources that could affect the project site:

- Plant G11755, which is a gas station located at 602 South Winchester Boulevard operated by Petro America about 900 feet southwest of the project site. At BAAQMD's direction, risk from the source was adjusted for distance based on BAAQMD's *Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities*. According to BAAQMD (and adjusted for the 900-foot distance), this facility would result in an excess cancer risk of 0.3 per million, PM_{2.5} concentration of 0.00 and HI of <0.01, all of which would be well below BAAQMD thresholds of significance.
- Plant G11422, which is a gas station located at 425 South Winchester Boulevard operated by Gas Depot about 700 feet northwest of the project site. According to BAAQMD (and adjusted for the 700-foot distance), this facility would result in an excess cancer risk of 0.4 per million, PM_{2.5} concentration of 0.00 and HI of <0.01, all of which would be well below BAAQMD thresholds of significance.
- Plant 13040, which is an emergency back-up generator located at 400 South Winchester Boulevard operated by FRIT about 700 feet north of the project site. At BAAQMD's direction, risk and PM_{2.5} concentrations from a diesel generator was adjusted for distance based on BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion (IC) Engines*. According to BAAQMD (and adjusted for the 700-foot distance), this facility would result in an excess cancer risk of 7.4 per million, PM_{2.5} concentration of <0.028 and HI of <0.01, all of which would be below BAAQMD thresholds of significance.
- Plant 13698, which is an emergency back-up generator located at 500 South Winchester Boulevard operated by BelmontCorp. According to BAAQMD, this facility has reported screening risk (assumed to be at a distance of 50 feet) of 5.8 per million, PM_{2.5} concentration of <0.01 and HI of <0.01, all of which would be below BAAQMD thresholds of significance.

Mitigation Measure AQ-3: Implement the following measures in site planning and building designs to reduce TAC and PM_{2.5} exposure where new receptors are located within the overlay buffer distances identified above:

- 1. Future residential development under the project located within the overlay distances from I-280 shall require site-specific analysis to determine the level of TAC and PM_{2.5} exposure, or for projects located near local surface streets with daily traffic volumes exceeding 10,000 ADT. This analysis shall be conducted following procedures outlined by BAAQMD. If the site-specific analysis reveals significant exposures, such as cancer risk greater than 10 in one million, additional measures shall be employed to reduce the risk to below the threshold. If this is not possible, the sensitive receptors shall be relocated.
- 2. For significant cancer risk exposure, as defined by BAAQMD, indoor air filtration systems shall be installed to effectively reduce particulate levels to a less-than-significant level. The project sponsor shall submit performance specifications and design details to demonstrate that lifetime residential exposures would result in less-than-significant cancer risks (less than 10 in one million chances).

Impact 5: Create objectionable odors affecting a substantial number of people? **Less-than-significant**

The project would generate localized emissions of diesel exhaust during construction equipment operation and truck activity. These emissions may be noticeable from time to time by adjacent receptors. However, they would be localized and are not likely to adversely affect people off site by resulting in confirmed odor complaints. The project would not include any sources of significant odors that would cause complaints from surrounding uses. This would be a *less-than-significant* impact

Impact 6: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? *Less than significant*

The BAAQMD May 2011 CEQA Guidelines included GHG emissions-based significance thresholds. These thresholds include a "bright-line" emissions level of 1,100 metric tons per year for land-use type projects and 10,000 metric tons per year for stationary sources. Land use projects with emissions above the 1,100 metric ton per year threshold would then be subject to a GHG efficiency threshold of 4.6 metric tons per year per capita. Projects with emissions above the thresholds would be considered to have an impact, which, cumulatively, would be significant.

CalEEMod was also used to predict GHG emissions from operation of the site assuming full build-out of the project. The project land use types and size along with other project-specific information were input to the model. The use of this model for evaluating emissions from land use projects is recommended by the BAAQMD. Unless otherwise noted below, the CalEEMod model defaults for Santa Clara County were used. CalEEMod provides emissions for transportation, areas sources, electricity consumption, natural gas combustion, electricity usage associated with water usage and wastewater discharge, and solid waste land filling and transport. CalEEMod output worksheets are included in *Attachment 1*.

Model Year

The model uses mobile emission factors from the California Air Resources Board's EMFAC2011 model. This model is sensitive to the year selected, since vehicle emissions have and continue to be reduced due to fuel efficiency standards and low carbon fuels. The Year 2019 was analyzed since it is the first full year that the project could conceivably be occupied. An Existing Zoned/Baseline scenario was also run for 2019. In order to run both scenarios, an Existing 2019 run was conducted, along with a Net Existing Zoned/Baseline 2019 run and a Net Proposed Project 2019 run. Net Existing Zoned/Baseline emissions were added to the Existing 2019 run to estimate the Existing Zoned/Baseline scenario. Similarly, Net Proposed Project emissions were added to the Existing 2019 run to estimate the Proposed Project scenario.

Land Use Descriptions

The Existing 2019 land use types and size were input to a CalEEMod run, with the following land uses: 60,000 s.f. of "Office Park," 214 hotel rooms entered as "Hotel," 726 dwelling units entered as "Apartments Mid-Rise," 472,161 s.f. of retail entered as "Strip Mall," and 98,742 s.f. of restaurants entered as "High Turnover (Sit Down Restaurant)."

The Net Existing Zoned/Baseline run consisted of 225,000 s.f. of "Office Park," 456 dwelling units entered as "Apartments Mid-Rise," 35,139 s.f. of retail entered as "Strip Mall," and 46,458 s.f. of restaurants entered as "High Turnover (Sit Down Restaurant)."

The Net Proposed Project run consisted of 495,000 s.f. of "Office Park," 456 dwelling units entered as "Apartments Mid-Rise," 35,139 s.f. of retail entered as "Strip Mall," 46,458 s.f. of restaurants entered as "High Turnover (Sit Down Restaurant)," and the 1,889 parking space structure.

Adjustments to the model are described below.

Trip Generation Rates

Default trip generation rates, trip lengths, and trip types specified by CalEEMod for Santa Clara County were used. Because the project site is located in a mixed-use area with proximity to regional transit, physical characteristics of the project were entered into the model. By the nature of the model, these physical effects are included in the mitigated portion of the model output.

- The project site jobs/acre and dwelling units/acre;
- The number of intersections per square mile;
- The distance to job center (the project itself will be a significant job center with many office and retail uses);
- The distance to the nearest transit station (Valley Fair Transit Center); and
- The project site will include an inter-connected pedestrian network.

Energy

Emissions rates associated with electricity consumption were adjusted to account for Pacific Gas & Electric utility's (PG&E) projected 2019 CO₂ intensity rate. This 2019 rate is based, in part,

on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. CalEEMod uses a default rate of 641.35 pounds of CO₂ per megawatt of electricity produced that is based on year 2008 emissions. The derived 2019 rate for PG&E was estimated at 306.68 pounds of CO₂ per megawatt of electricity delivered and is based on the California Public Utilities Commission (CPUC) GHG Calculator.⁸

The 2013 Title 24 Building Standards became effective July 1, 2014 and are predicted to result in 25 percent less energy use for lighting, heating, cooling, ventilation, and water heating than the 2008 standards that CalEEMod is based on.⁹ Therefore, the Net Zoned/Baseline and Net Proposed Project CalEEMod runs were adjusted to account for the greater energy efficiency of future zoned or proposed buildings.

Other Inputs

Default model assumptions for GHG emissions associated with area sources, solid waste generation and water/wastewater use were applied to the project.

Service Population

Project service population is the sum of future residents and full-time employees. The Proposed Project service population was estimated based on 3.11 persons per household (2009-2013) from the U.S. Census Bureau data for San Jose, ¹⁰ an assumption of 4 office employees per 1,000 square feet of office use, and 2.5 retail employees per 1,000 square feet of retail use, for a total project service population of 8,304.

Construction Emissions

GHG emissions associated with construction were computed to be 2,335 MT CO₂e for Lot 9, anticipated to occur over three separate calendar years, and 670 MT CO₂e for Lot 17, anticipated to occur over two separate calendar years. These are the emissions from on-site operation of construction equipment, hauling truck trips, vendor truck trips, and worker trips. The BAAQMD does not have an adopted Threshold of Significance for construction-related GHG emissions, though the District recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable. Best management practices assumed to be incorporated into construction of the proposed project include, but are not limited to: using local building materials of at least 10 percent and recycling or reusing at least 50 percent of construction waste or demolition materials. Construction of the proposed office building on Lot 9 would include the salvage and recycling of at least 50 percent of construction waste and use of recycled and/or local building materials.

⁸ California Public Utilities Comissions GHG Calculator version 3c, October 7, 2010. Available on-line at: http://ethree.com/public_projects/cpuc2.php. Accessed: February 20, 2015.

⁹ California Energy Commission, 2012. 2013 Building Energy Efficiency Standards FAO. May.

¹⁰ U.S. Census Bureau, 2015. San Jose (City), California Quick Facts. Available online: http://quickfacts.census.gov/qfd/states/06/0668000.html. Accessed: February 25, 2015.

Operational Emissions

The CalEEMod model, along with the project vehicle trip generation rates, was used to predict daily emissions associated with operation of the fully-developed site under the proposed project. In 2019, net annual emissions resulting from the Proposed Project above Existing Zoned/Baseline are predicted to be 3,047 MT of CO₂e. These emissions would exceed the BAAQMD threshold of 1,100 MT of CO₂e/yr. As discussed above, land use projects with emissions above the 1,100 metric ton per year threshold would then be subject to a GHG efficiency threshold of 4.6 metric tons per year per capita to determine impact significance. Computed project per capita emissions are 3.9 MT of CO₂e/year/service population, which would not exceed the BAAQMD threshold of 4.6 MT of CO₂e/year/service population. *This would be a less than significant impact*. Table 6 shows predicted project GHG emissions.

Table 6 Annual Project GHG Emissions in Metric Tons (CO₂e)

Source Category	2019 Existing	2019 Existing Zoned/Baseline	2019 Project Emissions
Area	44	72	72
Energy Consumption	4,502	6,394	7,630
Mobile	15,858	21,344	22,931
Solid Waste Generation	991	1,450	1,564
Water Usage	286	481	591
Total	21,681	29,741	32,788
Net Proposed Project			3,047
GHG Per Capita Emissions ¹			3.9
BAAQMD Threshold			4.6
			MT CO ₂ e/year/S.P.

Note: ¹Based on service population of 8,304.

Impact 7: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? *No Impact*.

The project would be subject to new requirements under rule making developed at the State and local level, including the 2008 Private Sector Green Building Policy, regarding greenhouse gas emissions and be subject to local policies that may regulate emissions of greenhouse gases.

Attachment 1: CalEEMod Output Worksheets and Construction Schedule

Attachment 2: Construction Health Risk Assessment Calculations

Construction Health Risk Modeling Emissions and Risk Calculations

Santana Row, San Jose, CA

DPM Construction Emissions and Modeling Emission Rates - Unmitigated

								Emissions
		DDM.	G.	N.T	ъ	DME :		per D: 46
Construction		DPM	Source	No.	ע	PM Emiss	ions	Point Source
Year	Activity	(ton/year)	Type	Sources	(lb/yr)	(lb/hr)	(g/s)	(g/s)
2014	Lot 9 Const	0.0185	Point	119	37.0	0.01126	1.42E-03	1.19E-05
2015	Lot 9 Const	0.2494	Point	119	498.8	0.15184	1.91E-02	1.61E-04
2016	Lot 9 Const	0.1002	Point	119	200.4	0.06100	7.69E-03	6.46E-05
2017	Lot 17 Const	0.1200	Point	70	240.0	0.07306	9.21E-03	1.32E-04
2018	Lot 17 Const	0.0808	Point	70	161.6	0.04919	6.20E-03	8.85E-05
Total		0.5689			1138	0.3464	0.0436	

Notes:

Emissions assumed to be evenly distributed over each construction areas

hr/day = 9 (7am - 4pm)

days/yr = 365 hours/year = 3285

PM2.5 Fugitive Dust Construction Emissions for Modeling - Unmitigated

Construction		Area		PM2.5 E	missions		Modeled Area	DPM Emission Rate
Year	Activity	Source	(ton/year)	(lb/yr)	(lb/hr)	(g/s)	(m^2)	g/s/m ²
2014	Lot 9 Const	LOT9_FUG	0.0930	186.0	0.05662	7.13E-03	12,741	5.60E-07
2015	Lot 9 Const	LOT9_FUG	0.08080	161.6	0.04919	6.20E-03	12,741	4.86E-07
2016	Lot 9 Const	LOT9_FUG	0.00255	5.1	0.00155	1.96E-04	12,741	1.54E-08
2017	Lot 17 Const	LT17_FUG	0.03790	75.8	0.02307	2.91E-03	7,014	4.15E-07
2018	Lot 17 Const	LT17_FUG	0.00071	1.4	0.00043	5.45E-05	7,014	7.77E-09
Total			0.2150	429.9	0.1309	0.0165		

Notes:

Emissions assumed to be evenly distributed over each construction areas

hr/day = 9 (7am - 4pm)

days/yr = 365 hours/year = 3285

Santana Row, San Jose, CA - Construction Health Impact Summary

Source Parameters for Point Sources Used in Construction Modeling

Source	Stack Height (ft)	Stack Diam (in)	Exhaust Temp	Volume Flow (acfm)	Velocity (ft/min)	Velocity (ft/sec)
Source	(11)	(111)	(F)	(acim)	(11/11IIII)	(1t/sec)
Construction Equipment	9.0	2.5	918	632	18540	309.0

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

	iction Emission	1100	· · · · · · · · · · · · · · · · · · ·			<u> </u>		Emissions per
Construction		DPM	Source	No.	D	PM Emissi	ions	Point Source
Year	Activity	(ton/year)	Type	Sources	(lb/yr)	(lb/hr)	(g/s)	(g/s)
2014	Lot 9 Const	0.0083	Point	119	16.6	0.00505	6.37E-04	5.35E-06
2015	Lot 9 Const	0.0713	Point	119	142.6	0.04341	5.47E-03	4.60E-05
2016	Lot 9 Const	0.0214	Point	119	42.8	0.01303	1.64E-03	1.38E-05
2017	Lot 17 Const	0.0262	Point	70	52.4	0.01595	2.01E-03	2.87E-05
2018	Lot 17 Const	0.0170	Point	70	34.0	0.01035	1.30E-03	1.86E-05
Total		0.1442			288	0.0878	0.0111	

Notes

Emissions assumed to be evenly distributed over each construction areas

 $hr/day = 9 \quad (7am - 4pm)$

days/yr = 365 hours/year = 3285

PM2.5 Fugitive Dust Construction Emissions for Modeling - With Mitigation

Construction		Area		PM2.5 E	missions		Modeled Area	DPM Emission Rate
Year	Activity	Source	(ton/year)	(lb/yr)	(lb/hr)	(g/s)	(m ²)	g/s/m ²
2014	Lot 9 Const	LOT9_FUG	0.0213	42.6	0.01297	1.63E-03	12,741	1.28E-07
2015	Lot 9 Const	LOT9_FUG	0.02190	43.8	0.01333	1.68E-03	12,741	1.32E-07
2016	Lot 9 Const	LOT9_FUG	0.00255	5.1	0.00155	1.96E-04	12,741	1.54E-08
2017	Lot 17 Const	LT17_FUG	0.00917	18.3	0.00558	7.03E-04	7,014	1.00E-07
2018	Lot 17 Const	LT17_FUG	0.00071	1.4	0.00043	5.45E-05	7,014	7.77E-09
Total			0.0556	111.3	0.0339	0.0043		

Notes:

Emissions assumed to be evenly distributed over each construction areas

hr/day = 9 (7am - 4pm)

days/yr = 365 hours/year = 3285

Santana Row, San Jose, CA - Construction Health Impact Summary

Unmitigated Emissions

	Maximum Co Exhaust	ncentrations Fugitive	Cance	r Risk	Hazard	Maximum Annual PM2.5
Construction	PM2.5/DPM	PM2.5	(per m	illion)	Index	Concentration
Year	$(\mu g/m^3)$	$(\mu g/m^3)$	Child	Adult	(-)	$(\mu g/m^3)$
2014	0.0182	0.2344	1.59	0.08	0.004	0.250
2015	0.2451	0.2037	21.46	1.12	0.049	0.418
2016	0.0985	0.0064	4.09	0.45	0.020	0.092
2017	0.0362	0.0271	0.95	0.16	0.007	0.062
2018	0.0243	0.0005	0.64	0.11	0.005	0.024
Total	-	-	28.7	1.9	-	-
Maximum Annual	0.2451	0.2344	-	_	0.049	0.418

Note: Maximum cancer risk occurs at a receptor height of 4.5 meters and maximum PM2.5 at 1.5 meters

Mitigated Emissions

Tribigatea Emission						
	Maximum Co	ncentrations				Maximum
	Exhaust	Fugitive		r Risk	Hazard	Annual PM2.5
Construction	PM2.5/DPM	PM2.5	(per n	illion)	Index	Concentration
Year	$(\mu g/m^3)$	$(\mu g/m^3)$	Child	Adult	(-)	$(\mu g/m^3)$
2014	0.0082	0.1981	0.7	0.0	0.002	0.205
2015	0.0700	0.2037	6.1	0.3	0.014	0.265
2016	0.0210	0.0237	0.9	0.1	0.004	0.042
2017	0.0079	0.0271	0.2	0.0	0.002	0.035
2018	0.0051	0.0021	0.1	0.0	0.001	0.007
Total	-	-	8.1	0.5	-	-
Maximum Annual	0.0700	0.2037	-	-	0.014	0.265

Note: Maximum cancer risk occurs at a receptor height of 4.5 meters and maximum PM2.5 at 1.5 meters

Santana Row, San Jose, CA - Construction Impacts Maximum DPM Cancer Risk Calculations From Construction Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: $CPF = Cancer potency factor (mg/kg-day)^{-1}$

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: $C_{air} = concentration in air (\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor EF = Exposure frequency (days/year) ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged.

 10^{-6} = Conversion factor

Values

Parameter	Child	Adult
CPF =	1.10E+00	1.10E+00
DBR =	581	302
A =	1	1
EF =	350	350
AT =	25,550	25,550

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Child - I	Exposure In	formation	Child	Adult - 1	Exposure In	formation	Adult
	Exposure			Exposure	Cancer	Mod	leled	Exposure	Cancer
Exposure	Duration	DPM Cor	nc (ug/m3)	Adjust	Risk	DPM Cor	nc (ug/m3)	Adjust	Risk
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)
1	1	2014	0.0159	10	1.39	2014	0.0159	1	0.07
2	1	2015	0.2142	10	18.75	2015	0.2142	1	0.97
3	1	2016	0.0861	4.75	3.58	2016	0.0861	1	0.39
4	1	2017	0.0351	3	0.92	2017	0.0351	1	0.16
5	1	2018	0.0236	3	0.62	2018	0.0236	1	0.11
6	1		0.0000	3	0.00		0.0000	1	0.00
7	1		0.0000	3	0.00		0.0000	1	0.00
8	1		0.0000	3	0.00		0.0000	1	0.00
9	1		0.0000	3	0.00		0.0000	1	0.00
10	1		0.0000	3	0.00		0.0000	1	0.00
11	1		0.0000	3	0.00		0.0000	1	0.00
12	1		0.0000	3	0.00		0.0000	1	0.00
13	1		0.0000	3	0.00		0.0000	1	0.00
14	1		0.0000	3	0.00		0.0000	1	0.00
15	1		0.0000	3	0.00		0.0000	1	0.00
16	1		0.0000	3	0.00		0.0000	1	0.00
17	1		0.0000	1.5	0.00		0.0000	1	0.00
18	1		0.0000	1	0.00		0.0000	1	0.00
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65	1		0.0000	1	0.00		0.0000	1	0.00
66	1		0.0000	1	0.00		0.0000	1	0.00
67	1		0.0000	1	0.00		0.0000	1	0.00
68	1		0.0000	1	0.00		0.0000	1	0.00
69	1		0.0000	1	0.00		0.0000	1	0.00
70	1		0.0000	1	0.00		0.0000	1	0.00
Total Increase	d Cancer Risl	ζ			25.26				1.71

Fugitive PM2.5 0.2344 0.2037 0.0064 0.0271 0.0005

Santana Row, San Jose, CA - Construction Impacts **Maximum DPM Cancer Risk Calculations From Construction** Off-Site Residential Receptor Locations - 4.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: CPF = Cancer potency factor (mg/kg-day)⁻¹

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: $C_{air} = concentration in air (\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor EF = Exposure frequency (days/year) ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged.

10⁻⁶ = Conversion factor

Values

Parameter	Child	Adult
CPF =	1.10E+00	1.10E+00
DBR =	581	302
A =	1	1
EF =	350	350
AT =	25,550	25,550

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Child - I	Exposure In	formation	Child	Adult - 1	Exposure In	formation	Adult
	Exposure			Exposure	Cancer	Mod	leled	Exposure	Cancer
Exposure	Duration	DPM Cor	nc (ug/m3)	Adjust	Risk	DPM Cor	nc (ug/m3)	Adjust	Risk
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)
1	1	2014	0.0182	10	1.59	2014	0.0182	1	0.08
2	1	2015	0.2451	10	21.46	2015	0.2451	1	1.12
3	1	2016	0.0985	4.75	4.09	2016	0.0985	1	0.45
4	1	2017	0.0362	3	0.95	2017	0.0362	1	0.16
5	1	2018	0.0243	3	0.64	2018	0.0243	1	0.11
6	1		0.0000	3	0.00		0.0000	1	0.00
7	1		0.0000	3	0.00		0.0000	1	0.00
8	1		0.0000	3	0.00		0.0000	1	0.00
9	1		0.0000	3	0.00		0.0000	1	0.00
10	1		0.0000	3	0.00		0.0000	1	0.00
11	1		0.0000	3	0.00		0.0000	1	0.00
12	1		0.0000	3	0.00		0.0000	1	0.00
13	1		0.0000	3	0.00		0.0000	1	0.00
14	1		0.0000	3	0.00		0.0000	1	0.00
15	1		0.0000	3	0.00		0.0000	1	0.00
16	1		0.0000	3	0.00		0.0000	1	0.00
17	1		0.0000	1.5	0.00		0.0000	1	0.00
18	1		0.0000	1	0.00		0.0000	1	0.00
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.•	.•	.•	.•	.•	.•	.•	.•	.•	.•
65	1		0.0000	1	0.00		0.0000	1	0.00
66	1		0.0000	1	0.00		0.0000	1	0.00
67	1		0.0000	1	0.00		0.0000	1	0.00
68	1		0.0000	1	0.00		0.0000	1	0.00
69	1		0.0000	1	0.00		0.0000	1	0.00
70	1		0.0000	1	0.00		0.0000	1	0.00
Total Increase	d Cancer Risk	ζ.			28.73				1.92

Fugitive Total PM2.5

0.1766

0.15340.0048

0.0228

0.0004

PM2.5

0.195 0.399

0.103

0.059

0.025

Santana Row, San Jose, CA - Construction Impacts Maximum DPM Cancer Risk Calculations From Construction Off-Site Residential Receptor Locations - 7.6 meters

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: $CPF = Cancer potency factor (mg/kg-day)^{-1}$

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: $C_{air} = concentration in air (\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor EF = Exposure frequency (days/year) ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged.

 10^{-6} = Conversion factor

Values

Parameter	Child	Adult
CPF =	1.10E+00	1.10E+00
DBR =	581	302
A =	1	1
EF =	350	350
AT =	25,550	25,550

		Child - I	Exposure In	formation	Child	Adult - l	Exposure In	formation	Adult
	Exposure			Exposure	Cancer	Mod	leled	Exposure	Cancer
Exposure	Duration	DPM Cor	nc (ug/m3)	Adjust	Risk	DPM Cor	nc (ug/m3)	Adjust	Risk
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)
1	1	2014	0.0157	10	1.38	2014	0.0157	1	0.07
2	1	2015	0.2122	10	18.58	2015	0.2122	1	0.97
3	1	2016	0.0853	4.75	3.55	2016	0.0853	1	0.39
4	1	2017	0.0329	3	0.86	2017	0.0329	1	0.15
5	1	2018	0.0222	3	0.58	2018	0.0222	1	0.10
6	1		0.0000	3	0.00		0.0000	1	0.00
7	1		0.0000	3	0.00		0.0000	1	0.00
8	1		0.0000	3	0.00		0.0000	1	0.00
9	1		0.0000	3	0.00		0.0000	1	0.00
10	1		0.0000	3	0.00		0.0000	1	0.00
11	1		0.0000	3	0.00		0.0000	1	0.00
12	1		0.0000	3	0.00		0.0000	1	0.00
13	1		0.0000	3	0.00		0.0000	1	0.00
14	1		0.0000	3	0.00		0.0000	1	0.00
15	1		0.0000	3	0.00		0.0000	1	0.00
16	1		0.0000	3	0.00		0.0000	1	0.00
17	1		0.0000	1.5	0.00		0.0000	1	0.00
18	1		0.0000	1	0.00		0.0000	1	0.00
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.•	.•	.•	.•	.•	.•	.•	.•	.•	.•
65	1		0.0000	1	0.00		0.0000	1	0.00
66	1		0.0000	1	0.00		0.0000	1	0.00
67	1		0.0000	1	0.00		0.0000	1	0.00
68	1		0.0000	1	0.00		0.0000	1	0.00
69	1		0.0000	1	0.00		0.0000	1	0.00
70	1		0.0000	1	0.00		0.0000	1	0.00
Total Increase	d Cancer Risk				24.95				1.68

Fugitive	Total
PM2.5	PM2.5
0.1042	0.120
0.0905	0.303
0.0029	0.088
0.0184	0.051
0.0003	0.023

Santana Row, San Jose, CA - Construction Impacts - Mitigated Emissions Maximum DPM Cancer Risk Calculations From Construction Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: $CPF = Cancer potency factor (mg/kg-day)^{-1}$

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: $C_{air} = concentration in air (\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor EF = Exposure frequency (days/year) ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged.

 10^{-6} = Conversion factor

Values

Parameter	Child	Adult
CPF =	1.10E+00	1.10E+00
DBR =	581	302
A =	1	1
EF =	350	350
AT =	25,550	25,550

		Child - Exposure In		formation	Child	Adult - Exposure In		formation	Adult
	Exposure			Exposure	Cancer	Mod	leled	Exposure	Cancer
Exposure	Duration	DPM Cor	nc (ug/m3)	Adjust	Risk	DPM Cor	nc (ug/m3)	Adjust	Risk
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)
1	1	2014	0.0071	10	0.62	2014	0.0071	1	0.03
2	1	2015	0.0612	10	5.36	2015	0.0612	1	0.28
3	1	2016	0.0184	4.75	0.76	2016	0.0184	1	0.08
4	1	2017	0.0076	3	0.20	2017	0.0076	1	0.03
5	1	2018	0.0050	3	0.13	2018	0.0050	1	0.02
6	1		0.0000	3	0.00		0.0000	1	0.00
7	1		0.0000	3	0.00		0.0000	1	0.00
8	1		0.0000	3	0.00		0.0000	1	0.00
9	1		0.0000	3	0.00		0.0000	1	0.00
10	1		0.0000	3	0.00		0.0000	1	0.00
11	1		0.0000	3	0.00		0.0000	1	0.00
12	1		0.0000	3	0.00		0.0000	1	0.00
13	1		0.0000	3	0.00		0.0000	1	0.00
14	1		0.0000	3	0.00		0.0000	1	0.00
15	1		0.0000	3	0.00		0.0000	1	0.00
16	1		0.0000	3	0.00		0.0000	1	0.00
17	1		0.0000	1.5	0.00		0.0000	1	0.00
18	1		0.0000	1	0.00		0.0000	1	0.00
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65	1		0.0000	1	0.00		0.0000	1	0.00
66	1		0.0000	1	0.00		0.0000	1	0.00
67	1		0.0000	1	0.00		0.0000	1	0.00
68	1		0.0000	1	0.00		0.0000	1	0.00
69	1		0.0000	1	0.00		0.0000	1	0.00
70	1		0.0000	1	0.00		0.0000	1	0.00
Total Increase	d Cancer Risl	ζ.			7.08				0.45

Fugitive	Total
PM2.5	PM2.5
0.1981	0.205
0.2037	0.265
0.0237	0.042
0.0271	0.035
0.0021	0.007

Santana Row, San Jose, CA - Construction Impacts - Mitigated Emissions Maximum DPM Cancer Risk Calculations From Construction Off-Site Residential Receptor Locations - 4.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: $CPF = Cancer potency factor (mg/kg-day)^{-1}$

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: $C_{air} = concentration in air (\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor EF = Exposure frequency (days/year) ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged.

 10^{-6} = Conversion factor

Values

Parameter	Child	Adult		
CPF =	1.10E+00	1.10E+00		
DBR =	581	302		
A =	1	1		
EF =	350	350		
AT =	25,550	25,550		

		Child - Exposure In		formation	Child	Adult - Exposure In		formation	Adult
	Exposure			Exposure	Cancer	Mod	leled	Exposure	Cancer
Exposure	Duration	DPM Cor	nc (ug/m3)	Adjust	Risk	DPM Cor	nc (ug/m3)	Adjust	Risk
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)
1	1	2014	0.0082	10	0.71	2014	0.0082	1	0.04
2	1	2015	0.0700	10	6.13	2015	0.0700	1	0.32
3	1	2016	0.0210	4.75	0.87	2016	0.0210	1	0.10
4	1	2017	0.0079	3	0.21	2017	0.0079	1	0.04
5	1	2018	0.0051	3	0.13	2018	0.0051	1	0.02
6	1		0.0000	3	0.00		0.0000	1	0.00
7	1		0.0000	3	0.00		0.0000	1	0.00
8	1		0.0000	3	0.00		0.0000	1	0.00
9	1		0.0000	3	0.00		0.0000	1	0.00
10	1		0.0000	3	0.00		0.0000	1	0.00
11	1		0.0000	3	0.00		0.0000	1	0.00
12	1		0.0000	3	0.00		0.0000	1	0.00
13	1		0.0000	3	0.00		0.0000	1	0.00
14	1		0.0000	3	0.00		0.0000	1	0.00
15	1		0.0000	3	0.00		0.0000	1	0.00
16	1		0.0000	3	0.00		0.0000	1	0.00
17	1		0.0000	1.5	0.00		0.0000	1	0.00
18	1		0.0000	1	0.00		0.0000	1	0.00
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65	1		0.0000	1	0.00		0.0000	1	0.00
66	1		0.0000	1	0.00		0.0000	1	0.00
67	1		0.0000	1	0.00		0.0000	1	0.00
68	1		0.0000	1	0.00		0.0000	1	0.00
69	1		0.0000	1	0.00		0.0000	1	0.00
70	1		0.0000	1	0.00		0.0000	1	0.00
Total Increased Cancer Risk 8.06 0.51						0.51			

Fugitive	Total
PM2.5	PM2.5
0.0405	0.049
0.0417	0.112
0.0049	0.026
0.0055	0.013
0.0004	0.006

Santana Row, San Jose, CA - Construction Impacts - Mitigated Emissions Maximum DPM Cancer Risk Calculations From Construction Off-Site Residential Receptor Locations - 7.6 meters

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6

Where: $CPF = Cancer potency factor (mg/kg-day)^{-1}$

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: $C_{air} = concentration in air (\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor EF = Exposure frequency (days/year) ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged.

 10^{-6} = Conversion factor

Values

Parameter	Child	Adult		
CPF =	1.10E+00	1.10E+00		
DBR =	581	302		
A =	1	1		
EF =	350	350		
AT =	25,550	25,550		

		Child - Exposure In		ormation Child		Adult - Exposure Information			Adult
	Exposure			Exposure	Cancer	Mod	leled	Exposure	Cancer
Exposure	Duration	DPM Cor	nc (ug/m3)	Adjust	Risk	DPM Cor	nc (ug/m3)	Adjust	Risk
Year	(years)	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)
1	1	2014	0.0072	10	0.63	2014	0.0072	1	0.03
2	1	2015	0.0621	10	5.44	2015	0.0621	1	0.28
3	1	2016	0.0187	4.75	0.78	2016	0.0187	1	0.08
4	1	2017	0.0074	3	0.20	2017	0.0074	1	0.03
5	1	2018	0.0048	3	0.13	2018	0.0048	1	0.02
6	1		0.0000	3	0.00		0.0000	1	0.00
7	1		0.0000	3	0.00		0.0000	1	0.00
8	1		0.0000	3	0.00		0.0000	1	0.00
9	1		0.0000	3	0.00		0.0000	1	0.00
10	1		0.0000	3	0.00		0.0000	1	0.00
11	1		0.0000	3	0.00		0.0000	1	0.00
12	1		0.0000	3	0.00		0.0000	1	0.00
13	1		0.0000	3	0.00		0.0000	1	0.00
14	1		0.0000	3	0.00		0.0000	1	0.00
15	1		0.0000	3	0.00		0.0000	1	0.00
16	1		0.0000	3	0.00		0.0000	1	0.00
17	1		0.0000	1.5	0.00		0.0000	1	0.00
18	1		0.0000	1	0.00		0.0000	1	0.00
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65	1		0.0000	1	0.00		0.0000	1	0.00
66	1		0.0000	1	0.00		0.0000	1	0.00
67	1		0.0000	1	0.00		0.0000	1	0.00
68	1		0.0000	1	0.00		0.0000	1	0.00
69	1		0.0000	1	0.00		0.0000	1	0.00
70	1		0.0000	1	0.00		0.0000	1	0.00
Total Increase	d Cancer Risk				7.17				0.46

Fugitive	Total
PM2.5	PM2.5
0.0214	0.029
0.0220	0.084
0.0026	0.021
0.0043	0.012
0.0003	0.005